Claims

1. Computer-based system (4, 4') for dynamic assignment of carrier frequencies to computerized access points (AP1, AP2, APn) of a wireless local area network (7), characterized by

5   a communication module for connection of the computer-based system (4, 4') via a communication connection (6) to the computerized access points (AP1, AP2, APn),

a memory module (105) for storing access point data about the computerized access points (AP1, AP2, APn), which access point data
10 comprise in each case at least the present carrier frequency of the respective computerized access point (AP1, AP2, APn),

an optimization module (100) for determining an optimal carrier frequency for a first of the computerized access points (AP2), based on the stored access point data about the computerized access points (AP1, AP2,
15 APn), and

a channel switching module (101) for setting the determined optimal carrier frequency in the first computerized access point (AP2) via the communication connection (6).

2. Computer-based system (4, 4') according to claim 1, characterized
20 in that it comprises a monitoring module (101) for capturing present operational values of the first computerized access point (AP2) via the communication connection (6), in that it comprises a weighting module (102) for calculating a weighting factor for the first computerized access point (AP2), based on the captured operational values of the first computerized access point (AP2), in that
25 the memory module (105) is set up to store access point data, comprising the calculated weighting factor of the first computerized access point (AP2) and weighting factors of the second computerized access points (AP1, APn), and in that the optimization module (100) is set up to determine the optimal carrier frequency for the first computerized access point (AP2), based on the stored

present carrier frequency for the first computerized access point (AP2), based on the stored weighting factors for the second computerized access points (AP1, APn) and based on the stored present carrier frequencies of the second computerized access points (AP1, APn).

5   3. Computer-based system (4, 4') according to claim 2, characterized in that the optimization module (100) is set up to determine the optimal carrier frequency for the first computerized access point (AP2), in that from among a multiplicity of defined radio frequency channels one radio frequency channel with an assigned carrier frequency is selected such that the sum of the

10   differences between the assigned carrier frequency and the stored present carrier frequencies of the second computerized access points (AP1, APn) is as large as possible, the differences being weighted in each case using the stored weighting factor for the respective second computerized access point (AP1, APn).

15   4. Computer-based system (4, 4') according to one of the claims 2 or 3, characterized in that the weighting module (102) is set up to calculate a weighting factor for the first computerized access point (AP2), based on a use rate for the first computerized access point (AP2), based on a failure rate for the first computerized access point (AP2) and based on a use probability for the

20   first computerized access point (AP2).

     5. Computer-based system (4, 4') according to one of the claims 2 to 4, characterized in that the monitoring module (103) is set up to capture a present operational value of the first computerized access point (AP2) indicating the present number of users who are associated with the first

25   computerized access point (AP2), to capture a present operational value of the first computerized access point (AP2) indicating the present number of received faulty data packets at the first computerized access point (AP2), and to capture a present operational value of the first computerized access point (AP2) indicating the present number of received errorless data packets at the first

30   computerized access point (AP2).

6. Computer-based system (4, 4') according to claim 5, characterized in that the weighting module (102) is set up to calculate a weighting factor for the first computerized access point (AP2), based on a use rate which is calculated by dividing the captured number of users of the first computerized
5　access point (AP2) by a maximal number of users of the first computerized access point (AP2), based on a failure rate, which is calculated by dividing the captured number of received faulty data packets at the first computerized access point (AP2) by the total number of received data packets at the first computerized access point (AP2), and based on a use probability which is
10　calculated from stored historical values for the captured number of users of the first computerized access point (AP2).

7. Computer-based system (4, 4') according to one of the claims 2 to 6, characterized in that it is set up to activate the optimization module (100) for determining the optimal carrier frequency of the first computerized access point
15　(AP2) when captured present operational values of the first computerized access point (AP2) indicate that the present number of users who are associated with the first computerized access point (AP2) is zero, and that the present number of received faulty data packets at the first computerized access point (AP2) exceeds a defined tolerance value.

20　8. Computer-based system (4, 4') according to one of the claims 2 to 7, characterized in that it comprises a first autonomous agent module (AM2), which is assigned to the first computerized access point (AP2), in that it comprises second autonomous agent modules (AM1, AMn) which are each assigned to one of the second computerized access points (AP1, APn), in that
25　the first and the second agent modules (AM1, AM2, AMn) are each implemented functionally in the same way, and comprise a monitoring module (103), a memory module (105), a weighting module (102), an optimization module (100), a channel switching module (101) as well as an update module (104), which update module (104) is set up to exchange the access point data
30　about the assigned computerized access point (AP1, AP2, APn) among the agent modules (AM1, AM2, AMn), the access point data comprising in each case an access point identification, the present carrier frequency and the calculated weighting factor of the assigned computerized access point (AP1,

AP2, APn), in that the agent modules (AM1, AM2, AMn) are each set up to activate the monitoring module (103) of the respective agent module (AM1, AM2, AMn) periodically to capture present operational values in the associated computerized access point (AP1, AP2, APn), and in that the agent modules

5 (AM1, AM2, AMn) are each set up to activate the update module (104) of the respective agent module (AM1, AM2, AMn) for the exchange of the access point data after a determined optimal carrier frequency has been set by the channel switching module (101) of the respective agent module (AM1, AM2, AMn) in the associated computerized access point (AP1, AP2, APn).

10   9. Computer-based system (4, 4') according to claim 8, characterized in that the memory module (105) is set up to store historical access point data about the computerized access points (AP1, AP2, APn), and in that the agent modules (AM1, AM2, AMn) are each set up not to activate the update module (104) of the respective agent module (AM1, AM2, AMn) for the exchange of the

15 access point data if the stored access point data of the respective agent module (AM1, AM2, AMn) coincide with historical access point data of the respective agent module (AM1, AM2, AMn).

        10. Computer-based system (4, 4') according to one of the claims 8 or 9, characterized in that the first autonomous agent module (AM2) and the

20 second autonomous agent modules (AM1, AMn) are each implemented on a separate computer (1, 2, 3), the separate computers (1, 2, 3) being connected to one another via a communication connection (5).

        11. Computer-based system (4, 4') according to one of the claims 8 or 9, characterized in that the first autonomous agent module (AM2) and/or at

25 least some of the second autonomous agent modules (AM1, AMn) are implemented on a common computer.

        12. Computer program product comprising: a computer-readable medium with computer program code means contained therein for control of one or more processors of a computer-based system (4, 4') for dynamic

30 assignment of carrier frequencies to computerized access points (AP1, AP2,

APn) of a wireless local area network (7) that are connectible to the computer-based system (4, 4') via a communication connection (6) such that

access point data about the computerized access points (AP1, AP2, APn) are stored in the computer-based system (4, 4'), which access point data
5 each comprise at least the present carrier frequency of the respective computerized access point (AP1, AP2, APn),

an optimal carrier frequency for a first of the computerized access points (AP2) is determined by the computer-based system (4, 4'), based on the stored access point data about the computerized access points (AP1, AP2,
10 APn), and

the determined optimal carrier frequency is set in the first computerized access point (AP2) by the computer-based system (4, 4') via the communication connection (6).

13. Computer program product according to claim 12, characterized
15 in that it comprises further computer program code means, which control the processors of the computer-based system (4, 4') such that present operational values of the first computerized access point (AP2) are captured by the computer-based system (4, 4') via the communication connection (6), in that a weighting factor for the first computerized access point (AP2) is calculated by
20 the computer-based system (4, 4') based on the captured operational values of the first computerized access point (AP2), in that access point data are stored in the computer-based system (4, 4') comprising the calculated weighting factor of the first computerized access point (AP2) and weighting factors of the second computerized access points (AP1, APn), and in that the optimal carrier
25 frequency for the first computerized access point (AP2) is determined by the computer-based system (4, 4') based on the stored present carrier frequency of the first computerized access point (AP2), based on the stored weighting factors of the second computerized access points (AP1, APn) and based on the stored present carrier frequencies of the second computerized access points
30 (AP1, APn).

14. Computer program product according to claim 13, characterized in that it comprises further computer program code means which control the processors of the computer-based system (4, 4') such that the optimal carrier frequency for the first computerized access point (AP2) is determined by the

5   computer-based system (4, 4') in that from among a multiplicity of defined radio frequency channels one radio frequency channel with an assigned carrier frequency is selected such that the sum of the differences between the assigned carrier frequency and the stored present carrier frequencies of the second computerized access points (AP1, APn) is as large as possible, the

10   differences each being weighted by the stored weighting factor of the respective second computerized access point (AP1, APn).

15. Computer program product according to one of the claims 13 or 14, characterized in that it comprises further computer program code means which control the processors of the computer-based system (4, 4') such that a

15   weighting factor for the first computerized access point (AP2) is calculated by the computer-based system (4, 4'), based on a use rate for the first computerized access point (AP2), based on a failure rate for the first computerized access point (AP2) and based on a use probability for the first computerized access point (AP2).

20   16. Computer program product according to one of the claims 13 to 15, characterized in that it comprises further computer program code means, which control the processors of the computer-based system (4, 4') such that a present operational value for the first computerized access point (AP2) is captured by the computer-based system (4, 4') indicating the present number of

25   users who are associated with the first computerized access point (AP2), in that a present operational value for the first computerized access point (AP2) is captured by the computer-based system (4, 4') indicating the present number of faulty data packets received at the first computerized access point (AP2), and in that a present operational value for first computerized access point (AP2) is

30   captured by the computer-based system (4, 4') indicating the present number of errorless data packets received at the first computerized access point (AP2).

17. Computer program product according to claim 16, characterized in that it comprises further computer program code means that control the processors of the computer-based system (4, 4') such that the weighting factor for the first computerized access point (AP2) is calculated based on a use rate, which is calculated by division of the captured number of users of the first computerized access point (AP2) by a maximal number of users of the first computerized access point (AP2), based on a failure rate which is calculated by division of the captured number of received faulty data packets at the first computerized access point (AP2) by the total number of received data packets at the first computerized access point (AP2), and based on a use probability which is calculated from stored historical values for the captured number of users of the first computerized access point (AP2).

18. Computer program product according to one of the claims 12 to 17, characterized in that it comprises further computer program code means that control the processors of the computer-based system (4, 4') such that the computer-based system (4, 4') carries out the determination of the optimal carrier frequency of the first computerized access point (AP2) if captured present operational values of the first computerized access point (AP2) indicate that the present number of users who are associated with the first computerized access point (AP2) is zero, and that the present number of received faulty data packets at the first computerized access point (AP2) exceeds a defined tolerance value.

19. Computer program product according to one of the claims 12 to 18, characterized in that it comprises further computer program code means that control the processors of the computer-based system (4, 4') such that the computer-based system (4, 4') acts as a first autonomous agent module (AM2), which is assigned to the first computerized access point (AP2), in that the computer-based system (4, 4') acts as second autonomous agent modules (AM1, AMn) which are each assigned to one of the second computerized access points (AP1, APn), in that the computer-based system (4, 4') periodically captures present operational values of the computerized access points (AP1, AP2, APn), to which agent modules (AM1, AM2, AMn) are assigned, in that access point data about the computerized access points (AP1,

AP2, APn) are exchanged by the computer-based system (4, 4') among the agent modules (AM1, AM2, AMn) after the determined optimal carrier frequency has been set in a computerized access point (AP1, AP2, APn), to which an agent module (AM1, AM2, AMn) is assigned, by the computer-based system (4,

5   4'), the access point data each comprising an access point identification, the present carrier frequency and the calculated weighting factor of the respective computerized access point (AP1, AP2, APn).

20. Computer program product according to claim 19, characterized in that it comprises further computer program code means that control the

10   processors of the computer-based system (4, 4') such that in the computer-based system (4, 4') historical access point data about the computerized access points (AP1, AP2, APn) are stored, and in that access point data about the computerized access points (AP1, AP2, APn) are not exchanged by the computer-based system (4, 4') among the agent modules (AM1, AM2, AMn) if

15   the stored access point data of the agent module (AM1, AM2, AMn) which is assigned to the access point (AP1, AP2, APn), in which a determined optimal carrier frequency was set, coincide with historical access point data.